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AUTHOR Rockler, Michael J.
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ABSTRACT

Studies of the brain and of the human culture can be used to demonstrate the limits of traditional approaches (based on psychological perspectives which are often narrow and restrictive) to learning styles and to offer additional perspectives on the complexity of learning. The study of the hemispheres of the brain and its triune nature indicates the limits of traditional approaches to learning style while broadening the scope of understanding of learning. Edward T. Hall, an anthropologist, has devised constructs about time, synchrony and communication which also facilitate comprehension about the nature of the problem. Many kinds of teaching procedures (taken from simulation/gaming and the process of facilitating creative behavior) can be identified to demonstrate ways to suppoort the complex nature of learning and to provide ways for balancing the many dualisms in human nature. (CB)

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LEARNING STYLES: An Anthropological Perspective

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Michael J. Rockler

Rutgers University

Camden, New Jersey 08102

ED278636

Introduction

The processes of teaching, learning, and supervision are among the most complex of human activities. Each of these difficult tasks is an essential part of the education profession. The study of these processes has often been approached superficially in ways that provide for measurement but are less than helpful to teachers, students and supervisors. The attempt to quantify teaching, learning and supervision can sometimes even diminish the understanding of these extremely complex operations.

The complexity of these processes derives, in part, from the fact that how one learns, how one teaches, and how one supervises is extremely idiosyncratic. Attempts to generalize about these activities as well as attempts to measure them can lead to confusion.

This presentation examines the nature of learning styles. It seeks to broaden the understanding of how people learn by drawing upon perspectives that come from the study of anthropology. The paper begins with an analysis of traditional approaches to the identification of learning style. It looks at studies of the human brain, examining ways that knowledge about its structure can add

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to an understanding of learning styles. It then discusses constructs devised by anthropologist Edward T. Hall which relate to time, synchrony, and communication. The essay concludes with a discussion of teaching procedures.

It is the thesis of this paper that human learning styles--because of the nature of the human brain and the nature of human culture--can vary within each individual. How one learns depends, in part, on what one is being asked to learn. Therefore the learning style of any particular person cannot be easily categorized.

Traditional Approaches to Learning Styles

In The Ghost in the Machine (10), Arthur Koestler describes the role of behaviorism in psychology. He begins by identifying "four pillars of unwisdom," which, he says, are beginning to show cracks. One of these is the reliance of behavioral psychologists on measurement. Koestler writes:

> ...<cracks are beginning to show in the belief> that the only scientific method worth that name is quantitative measurement; and, consequently, that complex phenomena must be reduced to simple elements accessible to such treatment, without undue worry whether the specific characteristics of a complex phenomenom, for instance, man, may be lost in the process. (p.3)

Making the case even more strongly Koestler goes on to say:

> By far the most powerful school in academic psychology, which at the same time determined the climate in all other sciences of life, was, and still is, a pseudoscience called Behaviourism. Its doctrines have invaded psychology like a virus which first causes convulsions, then slowly paralyses the victim. (p. 5)

Koestler's argument against behaviorism has been made by many others including Elliot Eisner (3) and Bruno Bettelheim (1). Behavioral psychology, which provides much of the conceptual base for education, has propelled the study of teaching toward attempts to quantify all aspects of the instructional process.

This committment to measurement can be seen in several traditional approaches to the identification of learning styles including the work of Rita and Kenneth Dunn (2) and the Myers-Briggs Type Indicator. (For a description of the Myers-Briggs Type Indicator, see Lawrence Gordon (11).)

The Dunns have developed a learning style inventory (LSI) for analyzing the conditions under which students prefer to learn. These conditions include the nature of the immediate environment, the nature of the emotional climate, sociological needs, and physical needs. The inventory attempts to determine individual needs for learning by asking students to respond to the following kinds of statements:

I study best when it is quiet

I have to be reminded often to do something.

I really like to mold things in my hands.

I do better if I know my work is going to be checked.

I study best at a table or desk.

The things I remember best are things I read.

I try to finish what I start

I can ignore most sound when I study.

I like to study by myself.

I really like to draw, color, or trace things.

The Myers-Briggs Type Indicator (MBTI) measures the way people prefer to perceive and to make judgements in learning situations. The categories in the MBTI include: extrovert, introvert, intuitive, sensing, thinking, feeling, perceiving and judging. By arranging these categories into combinations, Myers and Briggs identify sixteen learning styles.

Also representative of this approach to learning styles is the work of Anthony F. Gregorc (7). He created four categories of learning styles: concrete sequential, abstract sequential, abstract random, and concrete random. On the basis of tests, persons are placed in the category to which they have the greatest tendency. Gregorc then generalizes about the nature of each learning style. He identifies the ordering ability, thinking processes and creative nature of each learner under each category.

The limits of these kinds of learning style constructs relate to Koestler's criticism of behaviorism. They use a questionaire to measure each person and then place him or her in a category. Once identified, generalizations are made about the nature of particular learners.

The desire to identify learning style is commendable and the motivation of persons like Gregorc is certainly without fault. The problem lies in the overreliance on measurement which results in too narrow a perspective on

learning. This perspective can be enlarged by recognizing that the nature of learning style is highly complex and therefore difficult to measure and to categorize.

As will be demonstrated, persons often have dualistic tendencies in competing directions. Therefore the nature of their learning style depends in part on what it is they are expected to learn. How a person learns emerges from the interaction of his or her personal style with what he or she is being asked to study. This makes the identification of learning style very difficult by introducing the uniqueness of each individual into the process. It can, however, result in a more accurate understanding of the nature of learning.

Learning Style and the Hemispheres of the Brain

The human brain consists of two hemispheres connected by a large cable of nerve fibers called the corpus callosum whose function is to transmit the separate process of each hemisphere to each other. During the late 1950's and early 1960's a psychobiologist named Roger W. Sperry first described the nature of the two hemispheres. He received the Nobel prize for medicine in 1981 for his work on the brain. Sperry's basic hypothesis was that although both hemispheres of the brain are involved in high level cognitive work, each side of the brain specializes in its own style of thinking and each has its own capabilities. In effect, the two hemispheres use different modes for information processing.

The left hemisphere in most persons specializes in analytical thinking. It is the source of reason and logic and is the verbal side of the brain. The left

hemisphere is also the source of conceptual ability; it is the part of the brain that names and categorizes. The left lobe thinks linearly; it puts things in order and expects first things to come first. Using a term devised by Edward T. Hall, whose work will be described later, the left hemisphere of the brain supports monochronic culture.

For most persons, the right hemisphere functions in nonverbal, spatial and intuitive ways. It is the location of perception and its way of processing information is nonlinear and nonsequential. Instead of dealing with one thing at a time, the right hemisphere deals with many things simultaneously. In Hall's terms, it is the part of the brain that supports polychronic culture.

Early research on the hemispheres of the brain tended to rigidly divide their functions. The conclusion reached was that the two sides of the brain were independent lobes with totally differentiated purposes. The complete separateness of the two hemispheres has not been supported by later research. Neuropsychologist Karl Pribram--among others--has described the holographic nature of the brain. Pribram uses the hologram, a method of photography using laser light to create three dimensional pictures, as a metaphor for the brain. He argues that, like a hologram which can reconstruct a picture from any part, so the brain distributes information across its entire surface. Memory, for example, is stored over the entire area of the brain. Individuals who have lost fifty percent of the brain still retain almost one hundred percent of their memories. Other functions of the brain also exist holographically.

The holographic nature of the brain weakens the notion that the two hemispheres function independently. Rather it appears to be the case that the two sides of the brain specialize in different functions even though each is capable of doing the work of the other.

Betty Edwards, in a book called Drawing on the Artist Within (4), refers to the specialization of the left hemisphere as the "L-mode" and she labels the capabilities of the other hemisphere as "R-mode." For Edwards (who is a teacher of art), it is the R-mode which contains the unconscious part of creativity called incubation, a process that occurs while the conscious mind is engaged elsewhere. Using Edwards' conceptualization, the rigid division of the two hemispheres can be modified. One can view the two modes as capabilities of the brain occurring in the separate hemispheres but not necessarily limited to them. Thus one can conclude that the brain can do analytical, sequential, conscious, monochronic work (its L-mode activity) while it also intuitive, spatial, nonlinear, unconscious polychronic ability (its R-mode function).

Following the paradigm of behavioral psychology, educators have sought to measure persons in order to determine whether they are left or right hemisphere dominant. This has resulted in another kind of learning style categorization and another error in approach. In fact, all human beings have L-mode and R-mode ability just as all human beings have conscious and unconscious mental states. The mode that comes to the fore depends on what is being learned. When asked to analyze a quotation to determine the author's point of view, the L-mode capacity of the brain is called upon. When asked to draw a picture, the R-mode function is needed. While some people are clearly better at one kind of work than another, human potential can be best be realized when both modes are developed to their maximum capacity and when human beings achieve a balance between the two modes.

The narrow identification of learning style in individuals can harm the development of balance if it leads to prescribed activity that minimizes the ability to develop both modes of the brain. The use of measurement which too

rigidly categorizes persons and therefore limits their ability to develop fully should therefore be avoided.

The Ghost in the Machine

Arthur Koestler's The Ghost in the Machine (10) offers several perspectives that can add to an understanding of learning. First, it introduces the concept of holon--a description of the dual nature of all living things. Second, it characterizes human beings as open systems. Third, it describes the triune nature of the human brain.

All living things, from individual cells to human beings, are individuals as well as parts of more complex systems. This is Koestler's concept of holon. As individuals, all living things are self-assertive. As part of a system, each individual must be integrated into the whole. Human beings, in their daily living, must find a balance between the two. Self-assertion carried to an extreme leads to anarchy. Integration at its extreme is totalitarianism. Persons must learn in ways that provide a balance between self-assertiveness and integration into the whole.

Koestler's concept of holon has implications for learning style. It indicates that persons have dual tendencies with regard to self-assertivenss and integration just as their brains have both L-mode and R-mode capacities. The categorization of traditional learning styles forces educators to think in narrow terms and Koestler's concept is a reminder that human beings consist of a number of dualisms which all must be taken into account when approaching

learning.

Psychologists, Koestler argues, rely on the concept of association which is a behavioral oriented notion. It implies that persons associate one idea with another in an essentially conditioned manner. In contrast to associationism, Koestler talks of **bisociation**. This is a process by which human beings bring ideas together from different matrices which represent different planes of experience. These matrices can interact to create new cognitive structures. "Mental habits are governed by a fixed set of rules," Koestler writes, "but <are> capable of varied strategies in attacking a problem." The end result of the ability to bisociate is to make human mental processes an open-ended system--one which learns by continually restructuring what is known into new patterns. The open nature of human mental ability further demonstrates the limit of rigidly categorizing learning styles.

Koestler refers to the work of Paul MacLean, a medical doctor, who first described the "triune brain." During the course of evolution human brains developed in three vertical sections. The first of these sections is called the reptilian brain. This segment supports routine behavior and it is the part of the brain that becomes upset when routine is broken. It is based on the reptilian dependence on habitual behavior for survival. A more recently evolved segment of the brain is the paleomammalian. Its function is to require animals to be responsible for their young (rather than to eat them, as animals lacking this segment are prone to do). This portion of the brain also accounts for emotions. The third segment of the brain--the neomammalian brain--is found in human beings and is the source of the ability to reason. It also contains the section necessary for speech and written language.

Just as teaching must take the nature of L-mode and R-mode functions

into account in analyzing learning styles, so it must understand the triune nature of the brain. Each vertical part of the brain has its own function. Furthermore, while the hemispheres of the brain are connected by the corpus callosum which provides for horizontal integration, the three vertical parts of the brain are not integrated and this can lead to internal conflict. Differences, for example, can exist between what emotion dictates and what reason recommends.

Koestler views the conflict between the three brains as so serious that he considers their existence a possible evolutionary mistake that accounts for much of human conflict (war, murder, etc.). Koestler argues that the integration of the triune brain must come from chemistry. He calls for the development of a drug that will cause the three segments to function effectively in a synergistic manner. So far, of course, no such drug has been developed. Koestler wrote at a time when pharmacy seemed a useful answer to many social problems. He saw the birth control pill as an example of how chemistry could solve overpopulation. He did not, however, forsee the side effects of the birth control pill. Its limits also suggest the difficulty of trying to find a mind pill capable of integrating the triune brain.

The Ghost in the Machine introduced three additional perspectives on learning styles: 1) the nature of human beings as holons, 2) the open-ended nature of human thought resulting from the ability of people to bisociate, and 3) the triune nature of the brain. Each of these perspectives adds complexity to the question of learning styles.

The Anthropological Perspective of Edward T. Hall

Anthropologist Edward T. Hall has developed perspectives on time, synchrony, and communication which can add to an understanding of ways to improve instruction by recognizing differences in cultural styles which can affect learning styles. Hall described these constructs in two books--Beyond Culture (8) and The Dance of Life (9).

Time, Hall argues, is inseparable from culture--part of its core. He views it as a language--one which serves as a primary organizer for all activities; it is a way of handling priorities and categorizing experience.

People must learn the language of time as well as the spoken language in order to communicate. He writes:

> Some things are not easily bent to similar linear description. Time is one of them. There are serious misconceptions about time, the first of which is that time is singular. Time is not just an immutable constant as Newton supposed, but a cluster of concepts, events, and rhythms conveying an extremely wide range of phenomena. (The Dance of Life, p. 13)

Hall identifies several kinds of time. He discusses physical time based on the rotation of the earth and its movement around the sun. He describes biological time--the cycles of life and death experienced by all things in nature. (Puberty is one example of this. The phenomenon of jet lag also demonstrates it.) Hall also writes about personal time--the subjective feeling within people that time is flying or crawling. Members of some societies distinguish between sacred or profane time--the former relating to ceremonies that proceed within

an experiential framework of their own.

Hall describes two kinds of time that have particular relevance for the topic of this paper--micro and sync time. He defines micro time as a system that is congruent with and a product of primary level culture (PLC). Primary level culture for Hall is the "hidden cultural grammar" which defines the way in which people view the world. PLC determines values and establishes the basic tempos and rhythms of life. Micro time is one of the building blocks of culture.

Two subtypes exist within micro time: monochronic and polychronic time. Hall formulates the difference between the two as follows:

> Years of exposure to other cultures demonstrated that complex societies organize time in at least two different ways: events scheduled as separate items--one thing at a time--as in North Europe, or following the Mediterranean model of involvement of several things at once...I have termed doing many things at once: polychronic, P-time. The North European system--doing one thing at a time--is monochronic, M-time. P-time stresses involvement of people and completion of transactions rather than adherence to present schedules. Appointments are not taken as seriously and, as a consequence are frequently broken. P-time is treated as less tangible than M-time. For polychronic people time is seldom experienced as "wasted," and is apt to be considered a point rather than a ribbon or a road.
>
> Though M-time cultures tend to make a fetish out of management, there are points at which M-time doesn't make as much sense as it might. Life in general is at times unpredictable; and who can tell how long a particular client, patient, or set of transactions will take. These are imponderables in the chemistry of human transactions. What can be accomplished one day in ten minutes may take twenty minutes on the next. Some days people will be rushed and can't finish; on others there is time to spare, so they "waste" the remaining time. (The Dance of Life pp.46-47)

People in the United States and northern Europe tend to view micro time

as exclusively monochronic. But, Hall argues, M-time is arbitrary and imposed--a learned perception that "is not inherent in man's biological rhythms or his creative drives..." Yet it has become so thoroughly integrated into Western culture that is treated as the only logical and natural way of organizing life.

An understanding of these cultural differences is necessary for communication and for improved interpersonal relations between monochronic and polychronic societies. If the behavior of western peoples were to become more balanced between M-time and P-time, interpersonal relations might improve. Hall states:

> Polychronic cultures are by their very nature oriented to people. Any human being who is naturally drawn to other human beings and who lives in a world dominated by human relationships will be either pushed or pulled toward the polychronic end of the time spectrum. If you value people, you must hear them out and cannot cut them off simply because of a schedule. (The Dance of Life p. 53)

Hall's concept of sync time relates to the rhythms of relations between people. When people achieve interpersonal synchrony--when they are in sync--they are able to communicate and function together in ways that enhance mutual achievement. Communication requires that people be in sync with each other. Hal describes what it is like when people are in sync:

> Fortunately there is another kind of person: the one who is always in sync, who is such a joy, who seems to sense what move you will make next. Anything you do with him or her is like a dance; even making the bed can be fun. I know of no way to teach people how to sync with each other, but I do know that whether they do or

> not can make a world of difference in a relationship. (The Dance of Life p. 163)

Hall says that he cannot teach persons to be in sync with one another. He argues, however, that people find better synchronization in P-time because polychronic life requires group interaction while M-time culture emphasizes individual relationships. P-time provides better opportunity for men and women to do the dance of life together.

Hall uses the term "entrainment" to define the situation that exists when people are in sync. Entrainment means that two or more people are operating with the same rhythms.

In general, as culture approaches the polychronic end of the spectrum, it requires a greater degree of entrainment because the intensity of group interaction increases. Hence, an attempt to balance monochronic behavior with polychronic behavior also involves the need to increase entrainment.

Hall writes about the concept of extension. He says:

> Extensions are a particular kind of tool that not only speeds up work and makes it easier but also separates people from their work. Extensions are a special kind of amplifier...(The Dance of Life p. 130)

The telephone is an example of an extension of the human voice; the crane extends human strength and computers extend human memory and mental capacity.

Sometimes extensions are confused with the process being extended. Hall

calls this extension transference. For example, words which extend communication, can come to be seen as real in and of themselves rather than as symbols extending things and processes in the world.

The clock and the calendar are prime examples of extension transference. These extend the human ability to measure time but they can lead to the imposition of artificial schedules on people. The invention of the clock and the calendar are most responsible for the creation of monochronic time and they sometimes enslave people to schedules. Polychronic activity can redress the balance between natural time and time measured by the clock and the calendar.

The work of Edward T. Hall contains implications for the study of learning style. It demonstrates once again the complexity of learning. Persons can approach life polychronically or monochronically. They have the capacity for both kinds of activity. How they learn will depend on whether it requires monochronic or polychronic behavior as well as whether they are in sync with each other and whether entrainment exists in the learning environment. The role of extensions in learning must also be understood in determining what learning style is in effect.

The study of the brain and the study of culture leads to the conclusion that how one learns depends on what one needs to learn and under what conditions the learning is to take place. This extends the complexity of the concept of learning style beyond simple attempts to measure persons and categorize them. Any human being is capable of using a variety of learning styles. Too simple a categorization of a person may do him or her damage by forcing an imbalance. Under differing circumstances the same person may be capable of learning in a totally different manner.

Some Procedures For Facilitating Complexity

The foregoing perspectives add complexity to the concept of learning style. The conclusion that emerges is that the style of learning depends on what is being learned. Furthermore most approaches to teaching focus on too narrow a conception of learning. Teaching often engages the L-mode function, the neomammalian brain, and monochronic culture. Ths section of the paper offers some suggestions for classroom procedures that can extend the scope of teaching and learning.

Betty Edwards, whose book Drawing on the Artist Within (4) was cited earlier, is a teacher of art. She became interested in the process of creativity by seeking to understand why her students had so much difficulty with art and particularly with drawing. Her book, which is a guide to learning how to draw (based on her course for non-art majors), is also a book about creativity. She offers many exercises to improve the drawing skills of her students. Many of these can be useful in a variety of classroom settings for teachers who wish to increase innovative behavior and develop R-mode as well as L-mode activity.

Edwards' book contains an activity that helps students avoid L-mode censorship. They practice drawing figures upside down. This procedure is a useful one to introduce students to learn to use the right rather than the left hemisphere.

Michael P. Grady has published a book entitled Teaching and Brain Research (6), which contains activities for use in the classroom. In it, he briefly

introduces many topics and then he offers many pages of strategies. The book contains two chapters on activities, one for grades K-8 and the other for secondary school. The following language arts activity (for grades six to twelve) is illustrative of the kind of material found in Grady.

ONE PICTURE IS WORTH A HUNDRED WORDS

Someone once said: One picture is worth a thousand words. This activity gives students an opportunity to translate from visual to verbal expression and vice versa.

Materials

A photograph or painting with some detail.
Pencils
Paper
Camera
Mounting Board (optional)

Procedure

Have students choose a painting that makes a statement (i.e. a crowd scene, landscape, or cityscape).
Have students study this visual statement and put their visual imagery into writing.
Limit them to one hundred words (the left brain will appreciate this).
Students should make their written statements full of description and imagery. Students should make these statements grammatically correct.
After the writing is complete the students, armed with cameras, should try to recreate or capture the essence of their literary work in a photograph of their own creating (right brain comes through).

Evaluation

The teacher can evaluate both the written and visual work of the students according to agreed upon criteria. Students who don't do well in one area may shine in the other. (p.62)

The process of simulation/gaming as a teaching technique can also

facilitate polychronic culture, improve synchrony, and is itself an extension that can lead to positive results. The need for these skills increases in a world where complexity makes the possibility of polychronic life difficult to achieve. Many of the conflicts in the modern world can be seen as conflicts between cultures which are primarily monochronic and those which are polychronic.

Simulation/gaming fosters polychronic development because its central focus is usually the group. A major difference between P-time and M-time involves the perceptions of individuals and groups. Monochronic culture and monochronic people prefer one-on-one relationships just as they tend to live one minute at a time. Polychronic people seek to relate simultaneously to large numbers of people just as they perceive time in greater, less precisely scheduled segments. Games can increase polychronic behavior because they usually take place in groups and because many good games require polychronic behavior as they proceed.

Many simulation/games are able to achieve this. Culture Contact (designed by Abt Associates) is one example. This game brings two different cultures together--one polychronic and the other monochronic. Polychronic behavior must be developed by both teams for the game to end in a satisfactory manner. Each side must be able to evaluate aspects of the other culture while simultaneously pursuing its own goals. Simile II's BAFA BAFA, another game that involves competing cultures, and Starpower, an exercise that builds a three-tiered society, are other games in which polychronic values and behaviors are developed. Freeway Planning, a game by Michael Chester, involves a variety of group interactions which can bring about polychronic behavior.

Games can also develop interpersonal synchrony. Because of their group nature, players must develop rhythm between each other if the process is to be

effective. Games like the High School Geography Project's Metfab in which players must find a site for a factory and Robert Horn's Participative Decision Making, a simulation that examines the process of creating a school budget, have this quality as players work together to solve problems and make compromises. A game written by Rockler--Interdepartmental Decision Making demonstrates the problems that arise when people are not in sync and are not able to engage in polychronic behavior. Another exercise that involves polychronic skills and demands interpersonal synchrony is one called Parcoes in which teams must work together to create a product to be sold in a market.

Most simulations which use group decision-making and those which require the completion of a task by a group (and there are hundreds which do both) are games which can foster polychronic values and synchrony.

Hall's construct of the use and control of extensions (which are valuable human tools as long as they do not lead to extension transference) can also be facilitated by the use of the simulation process. Any good game is an extension, extending human experience by providing a vicarious, simulated experience. Games extend the ability to understand, communicate and experience; they can avoid extension transference by maintaining appropriate reality orientation--the balance between too little and too much detail.

William J.J. Gordon is the inventor of a procedure called "synectics," a system for facilitating creative behavior. Gordon originally applied his process to industry, serving as a consultant to many major companies who wanted help with creative problem solving. (Two products invented by Gordon's synectics groups include the space saver Kleenex box and the Pringle potato chip.) In recent years Gordon has turned his attention to education where he has been producing materials for teachers who wish to help students become more

innovative in their behavior. A set of materials for doing this was published in 1972 by Porpoise Books in Cambridge, Massachusetts. Gordon called this volume Strange and Familiar (5).

One exercise found in Gordon's book is called, "Blow Up." It is an excellent example of a teaching procedure consistent with the processes of learning described in this paper. The activity is an interdisciplinary one bringing together material from science, social studies, history, art, music and writing. It uses an understanding of volcanos as a metaphor for studying the American revolution. In doing so, it integrates pictures with music and words, asking students to write as well as draw. This activity can facilitate many kinds of learning styles.

Summary

Education as a discipline relies heavily on pyschology for its conceptualizations and as a result approaches many problems from the psychological perspective of behaviorism. This results in a tendency to create constructs that lend themselves to measurement. In approaching the study of learning styles, this has led to categories which are often narrow and restrictive.

Studies of the brain and of human culture can be used to demonstrate the limits of traditional approaches to learning styles and to offer additional perspectives on the complexity of learning. The study of the hemispheres of the brain and its triune nature indicates the limits of traditional approaches to

learning style while broadening the scope of understanding of learning. Edward T. Hall, an anthropologist, has devised constructs about time, synchrony and communication which also facilitate comprehension about the nature of the problem.

The R-mode activity of the brain can be related to polychronic culture just as its L-mode function can be related to monochronic culture. All of these behaviors originate in different parts of the triune brain.

Many kinds of teaching procedures (taken from simulation/gaming and the process of facilitating creative behavior) can be identified to demonstrate ways to support the complex nature of learning and to provide ways for balancing the many dualisms in human nature.

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